1. Record Nr. UNINA9910983076503321

Autore	Dong Zu-Shun
Titolo	High-Speed Monohull and Hydrofoil Craft : Performance, Technology, and Applications / / by Zu-Shun Dong, Liang Yun, Raju Datla, Alan Bliault
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2025
ISBN	9783031627606 9783031627590
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (666 pages)
Altri autori (Persone)	YunLiang DatlaRaju BliaultAlan
Disciplina	629.324
Soggetti	Marine engineering Vehicles Mechanical engineering Marine Engineering Vehicle Engineering Mechanical Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction to the High Speed Mono-Hull Crafts -- General Survey for the High Speed Mono-Hull Crafts, and Its Classifications -- Briefly Historical Development of High Speed Monohull Crafts -- Basic Principle of Planing Phenomenon -- Hydrodynamics on Two Dimensional Planing Surface in Ideal Fluid -- Comparison of Hydrodynamics Between Airfoil and Planning Surface at Limited Span -- Resistance of Planing Hull -- Various Semi-Theoretical and Semi-Empirical Methods for the Resistance Calculations -- Estimation Methods for Predicting the Resistance of Planning Hull -- Sea Seakeeping Quality of Planing Hull -- Static Stability -- Longitudinal Dynamic Stability of Planing Hull, and Its Porpoising Motion -- Some Special Planing Hulls -- Tunnel Planing Hulls -- “M” Crafts -- High Speed Transient Monohulls—Semi-Planing Hulls -- Resistance and Hull Profile Characteristics -- Introduction to the Hydrofoil Craft -- General

Survey for the High Speed Hydrofoil Crafts, and Its Classifications -- Basic Theory of Hydrofoils (1) – Introduction to the Airfoil Theory -- Theory of Two Dimensional Thin Airfoils -- Influence of Limited Span – Three Dimensional Thin Airfoil Theory -- Basic Theory of Hydrofoils (2) – Effect of Free Water Surface and Cavitations -- Effect of Free Water Surface and Its Basic Characteristics -- Calculation of Free Water Surface Effects by Means of Imaging Vortex Model Series -- Characteristics of Hydrofoil Crafts Performance -- Arrangement and Configurations of Hydrofoils -- Some Special Hydrofoil Crafts -- Foil-Assisted Hydrofoil Craft -- Foil-Catamaran -- Foil-Trimaran.

Sommario/riassunto

High Speed Monohull and Hydrofoil Craft: Performance, Technology, and Applications provides comprehensive coverage of the basic hydrodynamics of high-speed monohulls and hydrofoil craft useful to students and engineers alike. The first half of the book introduces different hull shapes for semi-planing and planing craft with examples from their development through the last century. Succeeding chapters then describe the hydrodynamic theory behind their performance in calm water and a seaway. They also document the extensive series of model test programs naval architects use to create prediction models for resistance and powering. Electronic versions of a number of these are included for readers' use. A final chapter on monohulls looks at hull geometric form that has been developed to provide the best possible combination of resistance in waves and motion response through a combination of a deep and sharp forefoot and a hard chine cross-section towards the stern for patrol vessels and offshore logistics craft. The book's second half introduces the various geometries and planform configurations of hydrofoils under a fast craft hull. It reviews the development of these craft for inland waterways, such as major river systems, and the rougher environment of seaways, such as the Mediterranean and Atlantic oceans. It is followed by hydrofoil theory in an ideal fluid close to a free surface. Then the theory for a real fluid includes the vorticity and effect of planform, dihedral, and surface interaction. Hydrofoil craft design and analysis are covered next. Finally, there is a chapter on special configurations, such as craft having foils just at the bow and hydrofoil craft based on catamaran hulls. Presents practical design and calculation methods based on vessels that have been built and put into service; Contains comprehensive references for each chapter, as well as a general technical resource appendix; Provides several simple electronic analytical models for engineers and students to build upon. .